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ABSTRACT

We examine the common claim that "best practices" are encompassed and represented in Enterprise Systems (ES). We suggest that an ES can at best only represent the *ostensive* and not the *performative* elements of work tasks. Thus, representation of best practice in an ES does not take *practical action* into account. This has two important implications. First, ostensive abstractions of best practice in an ES are a sparse and superficial representation of a "good" business process, at a specific moment in time. Second, the practical understanding required for performance is often ignored in the ostensive representation of best practice in the implementation of an ES. This constrains user and business adaptability. Inflexible coding of ostensive business tasks furthermore leads to rigidity where flexibility should be sought, to keep on top of the competition. Implications and directions for further research are discussed.

KEYWORDS

Enterprise Systems, practical action, best practice, ostensive, task performance

INTRODUCTION

Enterprise Systems (ES) are ready-made and potentially all-encompassing information system packages, which are purported to allow an organization to achieve intra-unit integration, and rapid dissemination of information. Furthermore, they are claimed to offer relative ease in scalability of the information system (Ross and Vitale, 2000). Such software packages are purported to contain 'best practices' as inscribed in the information systems by software developers, originating from its development and use in other organizations. In ES implementation, organizations may choose a single package or a combination of ES modules that suit their particular functional needs in business, and implement them accordingly. ES packages are often customized, although extensive customization is inadvisable due to cost, time and complexity (Markus and Tanis, 2000). In addition, since they are modelled after 'best practices', modification and customization would seem unnecessary, and detrimental. An industrial rule of thumb appears to be that only 20% of a package can be customized to better suit idiosyncratic practice where necessary.

ES have evolved from inventory control and materials requirement planning since the 1970's and 1980's to its current potentially all-encompassing nature. Despite extensive use in industry, ES implementation is however still regarded as highly troublesome. In spite of the intuitively obvious benefits of ES use in an organization, there are numerous aspects of implementation and use of ES that can and have gone wrong (e.g. Scott and Vessey, 2002). Such dramatic and public failures have perpetuated a lingering message of difficulty with such systems, which combined with best practices, provides an implicit no-pain-no-gain argument for its implementation. Playing into that no-pain-no-gain logic, some financial analyses suggest there are positive returns from ES related investments if an organization is willing to work at it (e.g. Anderson, Banker and Ravindran, 2003).

In contrast, some researchers are beginning to question the underlying benefits of using such systems, including an implied negative effect on competitive advantage or a less than beneficial impact on innovation (e.g. Davenport, 1998). In some cases organizational objectives have not been achieved following implementation (e.g. Larsen and Myers, 1999), while the most

dramatic implementation failures have led to bankruptcy (e.g. Scott and Vessey, 2002). At least in the short term, ES are known to impact productivity negatively before achieving a form of stable use in the organization (Hitt, Wu and Zhou, 2002).

Given these problems in using ES, some have wondered whether organizations are committing a strategic error in attempting to implement ES and hoping to achieve standardization in an organization. Davenport (1998) argues that standardized ES often erodes competitive advantage by destroying valuable idiosyncratic practices in an organization. The alternative is perhaps extensive customization, which is expensive, time-consuming, and difficult. Dell, for example, found packaged ES too rigid to suit its business model, and chose to abandon implementation after two years of expensive efforts to customize a standard package. Instead, it chose to develop a component-based system that was more amenable to its objectives given its particular business model and market (Fan, Stallaert and Whinston, 2000).

Another theme in ES research suggests greater user involvement in implementations as a critical success factor in implementation success, because it improves user input in deciding the final shape of the ES package in routine use (e.g. Sumner, 2000). This is perhaps further enhanced by user motivation toward ES implementation and organizational change (Kalling, 2003). The use of any information system relies on the successful adoption of that system at the user level, and so the discussion of fit, customization and user involvement illustrates the importance of user interaction with ES. Beyond variety of detailed implementation studies that dominate ES literature, some recent research has paid more attention to identifying issues related to the use of such systems and their consequent impacts (e.g. Devadoss and Pan, 2007).

In this context of ES research, this paper explores an underlying cause for the key issues that frequently appear in ES implementation. We examine the notion of tasks and its limited representation in software systems. This limited task representation in information systems lead to a loss in the practical understanding of a business process, following ES implementation, and the belief a process can be captured and reified in a single software system across time, is questioned. Conclusions and directions of further research follow thereafter.

TASKS AND INFORMATION SYSTEMS

Since ES relies on users and their interaction with inscribed business processes within organizations, we begin by exploring the nature of tasks in organizations. While tasks are represented through discrete, logical procedures, the execution of a task entails much more than just a series of steps, within or outside a software system.

Suchman (1983; p. 321) notably discusses the 'general relationship of any normative rules to the actual occasions of their use'. Executing any business process entails some additional and often significant work, in order to produce a procedure that "works" – which is seen as meaningful and skilled by both the employees and their customers. This work involves selecting appropriate procedures and making sense of them in the organizational context. 'Practical action', as she calls it, refers to the 'work of finding the meaning of organizational plans in actual cases' (Suchman, 1983; p. 321). Her 'practical action' provides an alternate conceptualization of what a business process is, with a number of important implications for ES implementation and business process design.

The guiding influences of Taylor's ideas are evident in the modern definition of a business process. Davenport and Short (1990; p. 12) define a business process as "the logical organization of people, materials, energy, equipment, and procedures into work activities designed to produce a specified end result (work product)". They further state: "A set of processes forms a business system – the way in which a business unit, or a collection of units, carries out its business." In this view an organization is defined as a collection of externalized business processes, which are executed in order to reach predefined organizational goals.

This view of a business process often excludes the important aspect of business process construction and execution in an organization – "practical action". We consider the view of practical action a direct challenge to the current view of ES implementation and business process. At a minimum, Suchman's (1983) 'practical action' expands our view to the numerous and potential infinite variety of activities beyond the discrete steps in executing a task. At the maximum, it raises significant challenges by claiming, as we suggest, that knowing a few rules doesn't allow you to play a good game. The focus on ES implementation and the best practices represented ostensively in an ES distracts and detracts from this important organizational and social reality. Related to this challenge, other researchers have explored the importance and primacy of 'practical action' in organizational life. One such perspective is 'sensemaking', as introduced by Weick (1995).

Discussing sensemaking in the context of pervasive electronic contexts in organizations, Weick (1985) suggests that electronic data forces users to abandon social cues that preserve properties of events, since such social cues are not captured

electronically. He argues that human operators benefit from their ability to step outside a situation to make sense of any set of circumstances. Human reliance on electronic terminals only affects this ability through action, comparison, affiliation, deliberation and consolidation deficiencies. In short, these deficiencies limit the ability of information systems users in understanding through constriction of what is conveyed, and in which manner. As a result, sensemaking often suffers with consequent failures within organizations.

Central to sensemaking (in the context of using information systems) is that people need to make sense of a situation beyond the limitations of the electronic representation of the data. The current influence of ES thinking about business processes, however, falls short in recognizing a need for sensemaking. A reformed view would argue that technologies that may help to trigger sensemaking by users, but not as a sensemaking process itself (Griffith, 1999).

In many work-related situations, with or without ES, the tasks are complex and adaptable to numerous nuances in the context. Suchman (1983) discusses the example of an accounting department in an office, where processing invoices is not necessarily orderly in practice, though procedures cast work in orderly sequences. In other cases involving ES, numerous pieces of material from a manufacturing plant were to be reused (Gattiker and Goodhue, 2004), but as each reusable piece needed a unique identification number per item in the ES, it was infeasible to use the ES. Instead, the employees used an excel spreadsheet and a clerk was added to the workforce. In this and many other situations, ES's failed to capture nuanced work practices and situations. The two examples illustrate different issues with the systems view of work that relies on sequentially accomplishing tasks, and information technology support for such procedures. A Tayloristic and structured view of work common in ES implementations, fails to capture the notion that 'procedures is an outcome to which practitioners orient their work – it is not the work itself' (Suchman, 1983; p. 327).

Alternatively, Feldman and Pentland (2003) put forward a theory that identifies the need to discuss the knowledge of a task and the execution of the task based on routines. They define an organizational routine as 'a repetitive, recognizable pattern of interdependent actions, involving multiple actors' (ibid; p. 96). Routines are often portrayed as consisting of fixed patterns. Organizational support for these patterns, for example through ES, may result in people choosing some patterns more frequently over others. They identify two problems with routines; lack of agency and variability of routines. They proposed a theory of routine as a duality, which is defined by both the *ostensive* and *performative*. The ostensive aspect is essentially an abstraction of a routine, and is non-specific. The performative aspect is the action taken by people performing a routine in an organization, and includes situation-specific interpretations of the rules in executing routines. Hence, the performative aspect includes the patterns of action used to accomplish a task. Consider the example of a travel itinerary to identify these two aspects of a routine. The ostensive aspect is the travel itinerary itself, listing travel 'details' such as flight details, destination etc. The performative aspect includes the actual details of the trip, such as getting to the airport, completing related formalities, security checks, waiting, losing your baggage etc.

Sensemaking and practical action suggest that people make sense of the various organizational inputs in an open system, in order to create organizing order (Weick, Sutcliffe and Obstfeld, 2005). In other words, individuals make sense, which informs their action. Like Feldman and Pentland (2003), we argue that the act of accomplishing a task in an organization involves more than following an ostensive procedure. A business system cannot be reduced to a book of instructions, or to a fully automated information system that would require no manual intervention. We argue that we should look beyond these implicit and Tayloristic views of task performance as a series of steps and information in an ES, and consider a business process as a performative and sensemaking act that is informed by the information system, but not restricted to it.

The representation of best practice in an ES omits the numerous natures and forms of *practical action* required to successfully execute a specific business process. Such practical action involves all of the expert and nuanced work required before and during the use of an ES, which invokes ostensive routines in order to satisfy a specific business need. Following that, a focus on only the information system can only be performative where human expertise is no longer required and a rigid rule can encapsulate all performative knowledge in a rigid and singular routine. In considering all best practices as embodied in an ES, this mechanistic thinking is carried to an extreme, where the ostensive functionality in the ES is considered best practice, and all human expertise of practical action is considered idiosyncratic and haphazard.

In the following, we will address how ES-lead best practice leads to a decrease in flexibility through design, and to the excessive reification of a business process as only its ostensive representation in an ES. This leads to a decreased competitive advantage through decreased business adaptability.

REPRESENTING TASKS IN ENTERPRISE SYSTEMS

If the process representation of a task in an organization does not adequately capture the performative aspect of the task, a significant aspect of task performance is ignored. Tasks should play an important part in deciding the nature of information technologies chosen to equip users in organizations. Theories on task and technology fit are a clear indication of this desire (e.g. Goodhue, 1995). Since information technologies can become overly restrictive on the organization, it is imperative that we consider task fit with information technologies.

Enterprise systems in particular can be distinguished from other information technologies, based on their highly integrated and packaged nature (Devadoss and Pan, 2007). Through design of best practice functionality, an ES imposes a particular informational logic on the organization (Davenport, 1998). Furthermore, highly integrated technologies such as ES can impose restrictions on the interpretive flexibility during use as well (Devadoss and Pan, 2007). ES complexity can also serve to unquestioningly preserve institutional influences (Gosain, 2004). Often, ES implementation and use has been a mindless instead of a 'mindful' choice grounded in the organizational context (Swanson & Ramiller, 2004).

Despite the extensive and long developments in ES since its MRP roots, Enterprise Systems suffer from the same limitations as any other information system: they can only represent an abstraction of the continuously changing needs of an organization (Hirschheim, Klein and Lyytinen, 1995). Even as memory systems, ES can only capture a part of the knowledge of tasks embedded in the system (Stijn and Wensley, 2001). Changing the organization to suit the system, or customizing the system to the organization may address such knowledge gaps (Stijn and Wensley, 2001). However, ES are complex and ostensive representations that cannot and will never be customizable to suit all the idiosyncratic and performative practices of an organization.

Given the complexity of ES and their impact on constraining human action in an organization (e.g. Gosain, 2004), the task technology fit of ES is an issue of importance (Gattiker and Goodhue, 2004). Bridging this gap too appears to be down to either of two options: change the system or change practice. Under some circumstances both these options may be impossible (Gattiker and Goodhue, 2004).

The essence of the above discussion in terms of task performance brings us back to our discussions of 'practical action' and the 'performative' aspect of routines. The pervasive adoption of information systems based on Tayloristic influences on tasks as procedural processes has led to two important outcomes. First, as a procedural workflow, business processes are meant to capture aspects (or perhaps abstractions) of task performance for various reasons such as institutional or organizational requirements. Performing a task is more about achieving a certain output, rather than the means of achieving that task. Feldman and Pentland (2003) cite the example of police routinely selecting suitable facts to fill in forms after arrests to comply with regulations.

A second important implication is individual control over data in performing a task. The individuals in an organization have lost control over how tasks are executed. In some sense, choices on how their input is processed have been pre-determined. In the case of ES, such pre-determination is most likely to have occurred outside the organizational context (Gosain, 2004). In the case of ES that do closely suit some tasks, other tasks in the same system are at risk of not suiting an organization completely. Such root causes lead to a lack of visibility, and control over data in organizations using ES, leaving users finding workarounds that may even exclude the ES (Robey, Ross and Boudreau, 2002). Such a lack of control is accentuated in organizations that are functionally organized, leaving task performers few cues towards fully comprehending the data as suggested by Weick (1985). ES literature too often reports on the lack of visibility, and the consequent disinterest of users in completing data that they do not directly rely on, and have no knowledge of consequent impacts elsewhere in the interdependent systems (e.g. Eriksen, Axline and Markus, 1999).

In summary, the discussion above traces problems with ES usage to ES design as a 'business system'. Since tasks in an organization can be seen to have two aspects, as in the theory of routines (Feldman and Pentland, 2003), or as including 'practical action' (Suchman, 1983), ES need to be simple enough to allow flexible use of the system to empower users and account for the need for internal flexibility following external change. However, despite whatever ability ES may have to empower, it will also be down to individual intentions in allowing such empowerment, or scuttling it with more control (e.g. Sia, Tang, Soh and Boh, 2002).

CONCLUSION AND DISCUSSION

ES are rigid complex systems which are commonly perceived as difficult, time-consuming and expensive to customize. But customization is what is needed of information systems in order to encapsulate the so-called idiosyncratic and performative practices in the organization. So why, then, do organizations adopt ES? We believe many ES implementations are driven by organizational fears that they will be left behind in a changing industry. As a result, organizations use ES to impose a uniform and ostensive logic in the hope of achieving competitive conformity. Thus, the organization is redesigned to follow suit.

Taylor's (1911) influence has ensured that the software industry mass-produces their solutions to an extended set of organizations, standardizing processes by incorporating 'best practices'. However, as this discussion demonstrates, very little 'practice' is embedded in an ES process. Successful practice of task execution from some 'successful' organization as theorized and abstracted may lead to a 'best practice'. However, reverse engineering the process and arriving at the practices of task execution from the abstract 'best practice' can be daunting and leaves practical understanding of operating the abstraction behind.

Following our discussions on the extent to which best practice can be encapsulated by an ES, we would like to emphasize the following three points.

First, we argue that practical understanding must follow suit to adapt to an ES, or is lost during ES implementation. This requires significant relearning for those required to learn how and what practical action is required in order to work with the new ostensive representation of the task in a new ES. This is not only an issue in terms of relearning, but also directly undermines practical action through a limitation in allowances for practical understanding in ostensive rules.

Second, these ostensive abstractions of "best practice" are often but a sparse and superficial abstract of what can only be part of a good business process - at a specific moment in time. Given that the practical action is the most significant part of what is meaningful to both customers and employees, that this changes over time, and that the ostensive representation in the ES is only a small part of a meaningful business process; our ignorance of practical action and our reification of the ostensive steps in an ES constrains required user and business adaptability. Under externally dynamic conditions, the organization must be able to follow suit rapidly, which it cannot under the rule of a rigid ES.

Third, this points to a paradox in ES implementation rationale. Organizations want to sign up to the logic of best practice to reach even ground with their competitors in the marketplace. While a company which implements ES might bring its intra-unit information system and business process up to a particular external standard, this enforces rigidity on the company. In other words, the increased competitive advantage in the short run leads to a vulnerable market position through decreased flexibility in a dynamic environment in the long run.

This ES paradox is in effect a set of complex and contradictory issues in implementing and using ES in organizations. The discussion identifies the antecedents of such a paradox in the differences in task performance by individuals and embedded processes in ES.

In the following, we discuss some directions for potential research and development. This discussion is a report of the preliminary search for some approaches to adopt, in addressing some or all of the problems identified in our discussions above.

The literature on ES implementation is enormous in many respects, and continues to grow seeking to identify various problems in implementation from the moment ES is identified as a potential solution to the post-implementation phase. Academic interest in ES is also probably fuelled by reports of anywhere up to 80% failure rate in ES implementations. ES implementation is a highly complex and expensive activity, and deserves the attention it has been receiving. Perhaps it is also an important failure of ES implementation research in that it focuses more on the project management of the implementation, than with the actual interaction of the users with the system. We argue that ES use should continue to be investigated as well.

An immediate solution that deals with this ES paradox would be the development of a system that can be malleable in user contexts. Such a system would allow the user to decide what data is needed to execute a task, and who needs to receive it to execute that task. The objective in such a system is to empower the user with the ability to decide on appropriate action needed to complete a task. An integrated system such as ES provides the advantage of providing a virtual organization in which users may identify the workflow as demanded by the task. Such 'objects' used in a task may then serve as templates

for other tasks as judged appropriate by the same individual or others. The objects may also grow or shrink according to the needs of individuals concerned with a task, acquiring or losing data characteristics to complete the workflow.

This wholly technical solution puts the performative aspect of a routine (or task) back in the hands of the individuals. However similar it appears to standardized business processes embedded in ES, the objective in such a system is that these task objects are created locally within the organization, mindfully created in the organizational context. This approach may not work in an organization attempting to radically change its existing practices. In the context of technology adoption, it may be appropriate to consider process redesign to leverage technology use. Accepting technology dictated logic, however, might only serve to erode any idiosyncratic practices of the organization endangering its competitive advantage. The significance of the proposed direction for a new system lies in its ability to put 'practical action' back in performing tasks, while using ES. Given these basic tenets, further research into this possibility is necessary.

Empowering individuals in organizations automatically highlights the issue of control (and perhaps power) in organizations. ES can become artefacts representing managerial desires to exercise greater control in an organization (Sia, Tang, Soh and Boh, 2002), while it certainly does not totally constrain users from finding their workarounds with the system (Boudreau and Robey, 2005). However, such tensions are not new to any technology, and the knowledge driven economy should enhance user empowerment and knowledge based application of their task expertise.

Future research should be directed at the degree to which the enterprise system touches upon which particular area of the organization. Also, it would be of interest to view the extent to which each of these areas contributes to the business process and their particular role in furthering competitive advantage. The role of the idiosyncratic and the flexible would be less interesting should it appear that little value is created in automation and restriction of those parts of the company. Also, how do we identify crucial functionality in an organization with particular strategic value when we have taken it for granted and have difficulty in identifying it? Finally, who should decide on how, when and where to draw an automational boundary?

In this context, this research is directed at exploring the nature of tasks in organizations, and the approach to such tasks embedded in systems. Further research of successful organizations that do manage with ES, and achieved amplified returns on their investments should be the focus once again.

In some sense, we may have to make more space for end user development in the new approach to designing ES in organizations. Given the advances in processing capabilities, and ubiquitous computing, we are perhaps now best positioned to rethink a new generation of ES – malleable in design, and encapsulating idiosyncratic practice before implementing best practice solutions where found necessary.

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